

OBSTACLE AVOIDANCE WALKING METHOD OF SELF-MOVING ROBOT

FIELD OF THE INVENTION

[0001] The present invention relates to an obstacle avoidance walking method of a self-moving robot, which belongs to the technical field of the manufacture of small household electric appliances.

BACKGROUND ART

[0002] The self-moving robot has been widely used for its convenient operation and freedom of movement, and has a variety of applications including window wiping, floor sweeping, air purification and so on. The self-moving robot sometimes runs into obstacle during its operation and can accurately and effectively avoid the obstacle during the self-moving walking process, hereby greatly improving the working efficiency. As an example of the glass-wiping robot, the prior art CN02137830.4 provides a method for identifying cleanable area and obstacle area for an automatic dust collector. FIG. 1 is a schematic diagram of the obstacle avoidance walking of the existing self-moving robot. Referring to FIG. 1, if the movements of the self-moving robot are classified into movements in the horizontal direction (X axis) and in the vertical direction (Y axis), FIG. 1 is a schematic diagram of the traversing in the X-axis direction and obstacle avoidance walking in the Y-axis direction of the self-moving robot. As shown in FIG. 1, the self-moving robot walks along the respective reciprocating paths of Y1, Y2 and Y3. When the self-moving robot runs into the obstacle A4, it bypasses the obstacle and walks in a reciprocating manner in the vertical direction, wherein the bypassing action is performed every time the self-moving robot runs into the obstacle A4 in the vertical direction. As a result of the walking mode of the existing self-moving robot, the walking on the path at the right side of the obstacle A4 is repeated for many times, which greatly prolongs the walking time and seriously impairs the working efficiency of the robot.

SUMMARY OF THE INVENTION

[0003] In view of the above deficiencies in the prior art, the present invention provides an obstacle avoidance walking method of a self-moving robot, which accurately determines obstacle position, provides a concise walking path, and greatly improves the working efficiency of the self-moving robot.

[0004] The above problems are solved by the following technical solutions according to the present invention.

[0005] An obstacle avoidance walking method of a self-moving robot is provided, in a walking area of the self-moving robot, a rectangular plane coordinate system is established with the horizontal direction as the X axis and the vertical direction as the Y axis, characterized in that, the method specifically comprises the following steps:

[0006] step 100: the self-moving robot walks along the Y axis, when the self-moving robot walks forwardly along the Y axis and detects obstacle, it sets an obstacle point at the current position as an upside obstacle point and stores valid upside obstacle points as upside recorded points; when the self-moving robot walks reversely along the Y axis and detects obstacle, it sets an obstacle point at the current

position as a downside obstacle point and stores valid downside obstacle points as downside recorded points;

[0007] step 200: according to storage sequence, the upside recorded points are classified into a current upside recorded point and previous upside recorded points, and the downside recorded points are classified into a current downside recorded point and previous downside recorded points;

[0008] step 300: if the current obstacle point is the upside obstacle point, it is determined whether there is before the current upside obstacle point a previous upside recorded point the Y-axis coordinate of which is less than that of the current upside obstacle point; and if the current obstacle point is the downside obstacle point, it is determined whether there is before the current downside obstacle point a previous downside recorded point, the Y-axis coordinate of which is larger than that of the current downside obstacle point;

[0009] step 400: if the determination result is positive, the previous upside recorded point or the previous downside recorded point is a turning point, the self-moving robot walks along the X axis from the current obstacle point toward the turning point to the X-axis coordinate of the turning point, deletes the coordinate of the turning point, and returns to the step 100 after completing traversal walking in an area between the turning point and the current obstacle point; and if the determination result is negative, the self-moving robot moves for a displacement M1 along the X axis;

[0010] step 500: the self-moving robot walks along a direction opposite to the former Y-axis walking direction, and returns to the step 100;

[0011] step 600: the step 100 to the step 500 are repeated until traversal walking in the walking area is completed.

[0012] The upside obstacle points and the downside obstacle points can be stored partially or wholly. Specifically, when the obstacle points are stored partially, the step 100 specifically further comprises:

[0013] if the Y-axis coordinate of the current upside obstacle point is different from that of each of the previous upside recorded points, the current upside obstacle point is the valid upside obstacle point; and if the Y-axis coordinate of the current downside obstacle point is different from that of each of the previous downside recorded points, the current downside obstacle point is the valid downside obstacle point.

[0014] When the obstacle points are stored wholly, the step 100 specifically further comprises: each of the upside obstacle points is the valid upside obstacle point; and each of the downside obstacle points is the valid downside obstacle point.

[0015] The step 400 specifically further comprises: if the determination result is positive, difference values of the X-axis coordinates of all of the upside recorded points or the downside recorded points that satisfy the determination condition from the X-axis coordinate of the current obstacle point are compared, and the upside recorded point or the downside recorded point having the largest difference value is taken as the turning point.

[0016] In order to reduce storage amount, the step 400 specifically further comprises: if the determination result is positive, the coordinates of all of the upside recorded points or the downside recorded points that satisfy the determination condition are deleted.